

S/PRTS

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Device for banding stacks of bank notes

Technical field

- 5 The invention relates to a device for packing stacked bank notes and can be used, for example in banks.

Background of the invention

10 For banding stacks (stubs) of securities a device is known, which comprises a body, band drive unit with reel-holder, pipe and a sensor for determining the length of band and looping unit. The device also comprises welding mechanism with welding head, a knife for cutting the band, mechanism drives and a control unit (RU, C1, 2123462).

15 The looping device has a stage for arranging a stub, which is assembled with the possibility of rotation relatively to the horizontal axis. The stage includes an arbor, a spring-loaded clamping arm and a tooth gear. The swinging stage serves for clamp of the end of the band with a swing-loaded arm and for its turn at formation of the loop. The
20 lower surface of the stage is intended for forming of welding seam. The

welding mechanism has a welding head, the advance of which is performed by means of a cam gear. The looping and welding gears have a common drive, on the arbor of which are placed the cams of each gear and a program disk, connected with the control unit.

5 The disadvantages of this construction is comparatively inefficient production of the device, due to the complex process of loop-forming, which consists of several stages, preliminary and final, and also due to the necessity of precise positioning of individual units and elements of the device.

10 A more efficient device would be that for banding stubs of bank notes, comprising a body, band drive unit with reel-holder, pipe and a sensor with obturator disk for determining the length of band, looping device with a stage, welding gear with welding head, a knife for cutting the band and gear drives, in which the looping unit is made as a pipe,
15 bounded with walls, which has the shape of a loop, and at the same time the stage for the stub is console fixed inside it, the welding gear is equipped with mechanical transfer for reciprocating drift and a couple of clamps, and is located in the body; the knife for cutting the band is mounted in the body of welding unit; the reel-holder is made in the shape
20 of a chute and placed in the upper part of the body over the looping pass;

the welding gear is located in the body directly under the stage of the looping unit and is equipped with a program bar with a sensor of linear drift, connected with the control unit (RU, C1, 2166466).

This engineering solution is taken as a prototype of the present
5 invention.

Its disadvantage is the circumstance that it doesn't provide for the possibility of banding a stack of bank notes with the help of a prefabricated ring, which perimeter precisely corresponds with the perimeter of a pile of bank notes. This causes a low efficiency of the
10 device; the principle, on which it is based, is the provision of complex movement of band, which band a loop in the process of banding, the loop being further tightened, after which the band is cut off; for this purpose serves a complex reversing band drive unit; a precise counting of the band length is necessary, for which purpose is intended an
15 obturator unit; besides, there is used a complex mechanism of band welding. Thus, the device is rather complicated, insufficiently efficient and provides for the banding of a stack of bank notes only with the use of welding, that is plastic (for example, polyethylene band; the use of paper band, or of prefabricated paper rings in this device is impossible.

Summary of the invention

The object of the invention is the creation of a non-complicated, high-efficient and reliable device for banding stacked bank notes.

5 According to this invention, the device for banding stacks of bank notes comprises a body, a container for packing material, a means for feeding said packing material and an element for arranging the stack of bank notes. The container for packing material is embodied in the form of a box-like structure, a packing material is embodied in the form of flattened, made of band rings which are stacked in the container. The
10 inventive device for feeding the packing material is embodied in the form of an element provided with a pick up unit and a mechanism for the displacing thereof. An element for arranging the stack of bank notes is embodied in such a way that it deforms the stack of bank notes along the
15 longitudinal axis thereof and is provided with a sensor for defining the position of said stack. Said element is also connected to a mechanism for displacing the element provided with the pick up unit. The element for arranging the stack of bank notes and the container for the packing material made in the form the of band rings are mounted on the body
20 with respect to each other in such a way that the deformed stack of bank

notes is introduced in a ring taken from the container; the element for arranging the stack of bank notes is embodied in the form of tubular casing, which converges from the inlet to the outlet and has a side cut along its full length, at this the deformation of a banknote pile occurs at
5 its motion along the tubular casing, and the withdrawal is effected through the side cut.

The applicant hasn't found any sources of information, which would contain data about engineering solutions, identical to the stated one. This allows, in the opinion of the applicant, to make a conclusion of
10 compliance of the invention to the criterion "novelty" (N).

The realization of characters of the stated invention (together with the characters, stated in the limiting part of the claims) conditions the creation of a fundamentally new feature of the object, which lies in the provision of possibility of effective banding stacks of bank notes with
15 the use of a prefabricated, mostly paper ring, the proportions of which correspond with the dimensions of a stack, and as a result of this, the ring tightly envelopes the stack; the procedure of banding is extremely simplified, the time of banding is reduced to minimum.

The stated circumstance allows to make a conclusion of compliance of the stated engineering solution to the criterion "invention step" (IS)

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Brief description of the drawings

Hereinafter the invention is elucidated with a detailed description of its embodiments with references to drawings, on which are pictured:

on fig.1 – front view;

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on fig. 2 - right-side view according to fig. 1;

on fig. 3 – an element for arranging the stack of bank notes in a larger scale;

on fig. 4 – the same as on fig. 3, with an arranged stack of bank notes;

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on fig 5 – front view of the container for packing material and a device for feeding the packing material.

Description of the preferred embodiments

The device contains the body 1, the container 2 in the form box-like structure, opened in the bottom; in the container 2 is placed the packing material made in the form of paper rings 3, which are stacked in the container 2 and are situated there in flattened condition.

The device for feeding said packing material comprises the element 4 with a pick up unit in form of roller 5, on the outer surface of which is reeled an adhesive tape with adhesive layer outwards.

The mechanism of displacement of the element with roller 5 comprises the arm 6, mounted on the axis 7. The arm 6 is firmly connected with the element 4. The element for arranging the stack of bank notes is embodied with the provision of possibility of its deformation relatively to its longitudinal axis; in the specific embodiment it is made in the form of tubular casing 8, which converges from the inlet 9 to the outlet 10. The tubular casing 8 has a side cut 11 along its full length from the inlet to the outlet. The tubular casing 8 is equipped with a sensor for defining the position of the stack of bank notes, performed in the form of the arm 12, installed with the provision of possibility of rotation relatively to axis 13. The arm 12 is connected

with the mechanism for displacement the element 4 with roller 5 by means of mechanic gear, which comprises pressure element 14, installed on the axis 13 and spring-loaded plate 15, attached to the arm 6. The return of the arm 6 to the original position is provided with the help of the spring 16. In the lower part of the container 2 on the edges of its outlet are placed the rests 18.

The device functions as follows:

A stack 17 of bank notes is fed through the inlet 9 of the tubular casing 8, which has relatively larger proportions in comparison with the outlet 10. At this the stack 17 of bank notes deforms (fig. 2), and its end comes out from the outlet 10 of the tubular casing 8. At movement inside the tubular casing 8 the stack 17 of bank notes presses the sensor for defining the position of stack of bank notes, made in the form of the arm 12, which rotates relatively to axis 13. At this the pressure element 14 turns and presses the spring plate 15, which is attached to the arm 6. The arm 6 turns down relatively to the horizontal axis 7, together with it turns the element 4 with roller 5, which in case of unavailability of a stack of bank notes inside the tubular casing 8 with the help of spring 16 is adjusted to the lower of the rings 3, located in the container 2. When the roller 5 moves downwards, turning with the

element 4 and the arm 6 relatively to the axis 7, due to the availability on its surface of adhesive tape, which is reeled with adhesive layer outwards, it drags along the ring 3, which turns from flattened due to its location in the container state to unfolded state (fig. 5), and is restrained
 5 in this state owing to the fact that the upper part of the ring is held by the rests 18, and the roller 5 pulls down the lower part of the ring. At this the end of the stack 17 of bank notes, which came out from the outlet 10 of the tubular casing 8, and at further movement of the stack of bank notes gets into the ring 3. After this the stack of bank notes through the cut 11
 10 in the tubular casing 8 is withdrawn from it to the right, if you look at figures 1, 2, 5.

The ring 3 stays on the stack of bank notes and bands it tightly. The device with the help of the spring 16 returns to the original position. It is ready for banding of the next stack of bank notes. The procedure of
 15 feeding of stack of bank notes in the tubular casing 8 and its withdrawal from it through the cut 11 can be effected manually or can be automated with the help of a simple mechanism.

Industrial applicability

- 5 For realization of the method an ordinary simple industrial equipment is applied, this allows to make a conclusion of compliance of the invention to the criterion "industrial applicability" (IA).